

OBSERVATIONS ON THE DISTRIBUTION OF BIRD SPECIES ON SMALL ISLANDS NEAR PERTH

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During 1975 while studying aspects of the ecology of Silvereyes (*Zosterops lateralis gouldi*) I visited nearly all of the small islets around Rottneest Island, and those between Rottneest Island and the Six Sisters some 40 km to the south. In all, 120 islets and stacks were visited. Here I present brief distributional notes for nine seabird species and for several other species seen. Previously unrecorded breeding sites for Wedge-tailed Shearwater, Pied Cormorant, Osprey, Silver Gull, Caspian Tern and Bridled Tern were found.

Details of visits are as follows: On February 24, 1975 all islets between Bird and East Shag Islands, Shoalwater Bay; on March 25 - 26, 1975 Armstrong, Monday, Duck, Joan and Phillip Rocks, Parakeet, and Dyer Islands and three nearby rocks (all adjacent to Rottneest Island); on October 3, 1975 islands between Point Peron proper and the Sisters (excluding Penguin I.); on December 6, 1975 Straggler Rocks, Mewstone, Rowboat and Seal Rocks, all islets around Carnac (including Shag, West, South-west, Arch and Flat Rocks), Entrance Rocks and Mushroom-shaped stack opposite Mt. Lotus on Garden Island; on December 12 1975 stacks near Mt. Haycock and Pt. Atwick, Garden Island; and on December 19, 1975 all islets around Rottneest Island apart from the four in Rocky Bay. Penguin Island was visited on October 6, 1974, March 8, 1975, July 25, 1975 and October 6, 1975. I visited Carnac Island on August 27, 1974, and in 1975 seven weeks were spent there, as follows: January 20-26 (inclusive), March 11-17, April 29-May 5, June 24-30, August 5-11, September 23-29 and November 11-17.

I hope to publish comprehensive notes on the avifaunas of Garden and Carnac Islands later. Storr (1964) has already very fully described the avifauna of Rottneest Island and some of its stacks and no mention of the birds on Rottneest Island proper will be made here. The situation in the 1940's for the larger islands in Shoalwater Bay was documented by Serventy and White (1943). Storr's and Serventy and White's checklists provide reliable baselines with which to monitor subsequent distributional changes.

ANNOTATED LIST

Little Penguin, *Eudyptula minor*. Common breeding resident on Carnac Island, taking advantage of plentiful loose soil at base of limestone cliffs for burrowing. Serventy and Whittell (1962), but not Serventy *et al.* (1971) record the Mewstone and Green Island (near Rottneest) as breeding sites. Certainly the latter is too steep-sided on all sides for penguins to climb up, and although the former has suitable burrowing sites I did not notice any carcasses or characteristic guano. A carcass was found on Seal I. in March and several birds were heard braying under *Rhagodia* bushes just above the beach in October. None were noticed on Middle Shag I. or Bird I. Undoubtedly Penguin I. is, with Carnac I., their West coast stronghold.

Wedge-tailed Shearwater, *Puffinus pacificus*. Common resident on Carnac I., where the distribution of their burrows was mapped by Watson (1956). Burrows also were found on Green and Dyer Is. and Flat Rock and birds were seen on Carnac I. and Flat Rock. A few burrows, possibly belonging to this species, were found on East Cathedral Rock (Eagle Bay, Rottneest), Duck Rock and Shag Rock (north of Carnac I.). Burrows on Parakeet I. near Rottneest presumably are of this species, as *P. assimilis* was not recorded by Storr (1964) as still breeding there.

White-faced Storm-Petrel, *Pelagodroma marina*. Five burrows of this species were found in March on a cliff just north of the beach on Bird I. None was noted on Seal I., where recorded by Serventy *et al.* (1971).

Pied Cormorant, *Phalacrocorax varius*. Nesting colonies were found as follows: Dyer I. (March, eggs and large young but only about 20 nests active); Flat Rock (recently used nests); South-west Rock (recently used nests on north side); West Rock (a few old nests); southern peninsula of Carnae I. (a few nests in use on August 27, 1974, but none used in 1975); Bird I. (recently used nests); West and Middle Shag Is. (large young in October); North-west Sister I. (eggs) and South-east Sister I. (eggs noted).

Many islands have a substantial covering of cormorant guano, and are presumably favoured loafing sites. Such islets include Phillip Rock, Middle Twin Rock, Dyer, rock stack near beach in Stark Bay, Duck Rock (all near Rottnest), tallest of Straggler Rocks, Mewstone, Rowboat Rock, headlands and beaches of Carnae I., South-west Rock, Flat Rock, the western Entrance Rocks, South Brother Rock, stack off Mt. Haycock, Garden I., rock north of Fisherman Head, Cape Peron, Mushroom-shaped rock south of Fisherman Head, West, Middle and East Shag Is., Second Rock south of Penguin I., and Passage Rock. Of course many other rocks that are exposed at low tides are used for resting.

Mountain Duck, *Tadorna tadornoides*. My only records are from on or near the eastern beach of Carnae I.: Two in August 1974, four in March 1975, two in June 1975 and three in August 1975.

Osprey, *Pandion haliaetus*. I know definitely of five nests, one on Garden I. and four on Rottnest I.: on stack near Pt. Atwiek, Garden I. (two adults and two free-flying juveniles); stack on beach in Salmon Bay (two adults, no eggs or young); stack at south-western end of Strickland Bay (two adults, one egg which was presumably added and one large chick); Middle Cathedral Rock (unattended nest); one small, low nest on stack west of North Point of Rottnest I. is presumed to be a new nest. A large stack in Rocky Bay was not landed on but apparently has an Osprey nest.

One osprey was seen perched on a pole on one of the North-eastern Straggler rocks, and one was seen overhead at Carnae I. in March and two overhead there in August. There are certainly no nests on or near Carnae I., perhaps because the extent of reef is insufficient for a pair to forage over.

Turnstone, *Arenaria interpres*. Six were seen on eastern beach on Carnae I. in January, four on the Entrance Rocks and one on Bird I. in October.

Silver Gull, *Larus novaehollandiae*. Gulls were observed on Phillip Rock, Joan Rock (nesting in March), Dyer I., Green I., Middle Cathedral Rock (dead chick), eastern Cathedral Rock, stack west of first point north of jetty in Geordie Bay, Armstrong Rock, Parakeet I., Monday Rock (recently used nest), Duck Rock, Mewstone (dead chicks), Shag Rock (dead chick), South-west Rock (dead chicks), Flat Rock, islet farthest from Pt. Peron proper (50 birds, some nesting), White Rock (recently used nest), Bird I. (nesting in October), Seal Island (hundreds nesting), West and Middle Shag Is., Islet north-east of Penguin (one nest), Passage Rock and north-western Sister I. (one chick). On Carnae I. they mass around the eastern beach in March, and breeding begins soon after. Two chicks were found in April/May, and hundreds of chicks were found in June, August and September. By November breeding had markedly decreased. Gulls on Carnae I. have a double-brooding regime (Nicholls, 1974). The largest colonies in the area covered in this paper are on Carnae, Penguin and Seal Islands.

Pacific Gull, *Larus pacificus*. Non-breeding birds were reported from Penguin and Seal Is. by Serventy and White (1943). None noted, possibly because of increased populations of Silver Gulls there recently.

Caspian Tern, *Hydroprogne caspia*. None seen on the stacks around Rottnest I. One observed on Carnae on August 27, 1974. One pair nested near the northwestern end of Carnae I. and in August two large chicks

were present. In September and November two birds apparently nested on the southern peninsula of Carnac I. as I was dive-bombed consistently, but a thorough search did not reveal a nest. Three were observed on the eastern beach in February, and one in June, on Carnac I.

On Bird I. in October one pair was found with one large chick still on the nest and a pair was on Seal I. in October and from their behaviour toward me were probably nesting.

Crested Tern, *Sterna bergii*. Seen loafing on Armstrong Rock and Green I. in March. They occur all year round at Carnac I. In August 60 adults with eggs or very young chicks were found on the northern peninsula of Carnac I.; by September 40 adults with 50 large chicks (forming creches) were present, but by November all had flown. One large fledgling was seen to beg from two adults on the eastern beach of Carnac I. in November.

A colony of 20 adults, with eggs, was present on the northern end of Seal I. in October.

Bridled Tern, *S. anaethetus*. Widespread. On Carnac I. found in January (but not March) but absent until September when six were seen. By November hundreds had arrived. Found on Phillip Rock (but not March 25), Joan I. (not March 26), Dyer I. (not March 26, one chick found in December), Middle and eastern Cathedral Rocks, rock west of first point north of jetty in Geordie Bay, Parakeet I. (not March 25), Clune Rock, Duck Rock (not March 25), but surprisingly not on Green I. or Monday Rock. Also occurs on the tallest of the Straggler Rocks, a vegetated rock southwest of the last, Mewstone, Shag Rock, West Rock, South-west Rock, Flat Rock, islet south west of Flat Rock, Arch Rock (one chick found), islet farthest from Point Peron proper, Bird I. (February and October), Seal I. (February and October), West and Middle Shag Is. (February and October), East Shag (October only), first islet south of Penguin (February and October), and eastern Tub Rock. It is probable that most, if not all, of these records are also breeding sites.

Silvereye, *Zosterops lateralis gouldi*. In March one was seen to fly across to Rottnest I. from Green I. Two were seen in *Nitratia* thickets on Flat Rock and presumably were vagrant from Carnac I., where some are present all year.

ACKNOWLEDGEMENTS

My research on Silvereyes is supported by the Australian Research Grants Committee. I thank Bob Black, Dave Bray, Gavin McGlashan and John Scott who on the various visits handled the boat while I was ashore on the islets. Dr. T. Riggert allowed me use of a boat at Rottnest in March and Mr. B. Carmichael of the Department of Fisheries and Fauna arranged transport to Carnac I. on August 27, 1974.

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NOTE ADDED IN PROOF

I revisited Carnae Island from August 31 to September 7, 1976. Conspicuous changes in abundance of two seabird species were noted. About 100 Pied Cormorant nests were found on the southern peninsula, resulting in considerable damage to the vegetation. Six nests each had one chick close to leaving the nest, and four nests had either eggs or very small chicks. The rest had already been used. Hundreds of cormorants were observed resting on this peninsula, as well as on Flat Rock.

The Crested Tern rookery on the NE peninsula was reduced to seven birds, and I found one nest with one egg, one nest with one small chick, and two runners. A pair of Caspian Terns nested in exactly the same place as 1975, and I found a scrape containing one large chick. No Bridled Terns had yet appeared.

THE COLLECTION OF POPLAR RUST SPORES BY HONEY-BEES

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SUMMARY

The Collection of uredospores of *Melampsora larici-populina* on *Populus nigra* var. *italica* by *Apis mellifera* is reported. Uredospores were identified from corbiculae as well as from the contents of larval food reserves in a bee-hive. This is the first record of the collection of rust spores by honey-bees.

INTRODUCTION

The spores of fungi have exploited the agents of wind and water very effectively for dispersal, there being few examples of insect-dispersed fungi. Insects are more often attracted to aromatic exudates, such as those associated with the conidia of *Claviceps* and pyrenidiospores of some rusts, than they are to the spores themselves. Indirect dispersal of fungal spores by the movement of insects over infected trees or flowers can have serious consequences. The Dutch elm disease was effectively spread by bark-beetles. There are no reports in the literature on the collection of rust uredospores by insects. Rusts are important plant pathogens and the possible spread of rust spores by insects should not be overlooked.

OBSERVATIONS

During March and April, 1976, large numbers of the introduced honey-bee (*Apis mellifera*) were observed foraging amongst leaves of the Lombardy poplar (*Populus nigra* var. *italica*) in two stands, approximately 2 km apart, near Kalamunda. The trees were heavily infected with the European Poplar Rust (*Melampsora larici-populina* Klebahn). This plant pathogen was recently reported in Australia and New Zealand (Anon., 1974/5; Van Kraayenoord *et al.*, 1974; Walker *et al.*, 1974). The latter paper documents the detection, spread and host range of poplar rusts in Eastern Australia.

Infected leaves are characterized by necrotic patches, 2-5 mm across, on their upper surface corresponding to eruptions of uredia on the lower surface. The uredia produce elongated, spiny uredospores approximately $36 \times 18 \mu\text{m}$. The spores are bright yellow due to a pigment located inside the cells. Groups of yellow uredospores tend to aggregate because of their spines and fall in groups when the leaves are shaken. Due to their colour and dryness they have the superficial appearance of groups of pollen grains on the lower surface of the leaf. The lower leaves and older leaves are first infected by the disease, but on some larger trees examined, the disease had progressed about 18 m high to the top branches.

Bees were actively working infected poplar trees, gathering the yellow rust spores. Samples of bees collected from the trees had their corbi-